

## REMARKS

Claims 1-26 and 81-89 are currently pending. No claims have been amended. Based on the following remarks, the Applicants respectfully request reconsideration of the Application.

### Rejection under 35 U.S.C. §103 in view of *Isfeld*, *Hagsand* and *Chuprun*

The Examiner rejected claims 1-6, 8-10, 12-19, 21-23, 25-26 and 81-89 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 5,828,835 (*Isfeld*) in view of United States Patent No. 7,254,142 (*Hagsand*) and United States Patent No. 6,115,580 (*Chuprun*). The Applicants respectfully traverse these rejections.

*The cited art does not disclose or suggest each element of claim 1*

Among other limitations, claim 1 recites:

determining a route for a **unidirectional** channel from a source processing node to a destination processing node within the array of processor nodes, the determined route based on a physical description of the array of processor nodes;  
generating the **unidirectional** channel along the determined route from the source processing node to the destination processing node, the **unidirectional** channel having a bandwidth requirement;

The Examiner correctly states that the combination of *Isfeld* and *Hagsand* does not disclose the steps of “determining a route for a unidirectional channel from a source processing node to a destination processing node within the array of processor nodes” and “generating the unidirectional channel along the determined route from the source processing node to the destination processing node” as recited in claim 1 (*Office Action*, p. 3, para. 5 and continued on p. 4, para. 1)

*Chuprun* does not cure the deficiencies of *Isfeld* and *Hagsand* with respect to the embodiment of claim 1. *Chuprun* discloses a system for identifying an optimal bi-directional path of network nodes for a network connection such as an Internet connection over an

outdoor terrain. The nodes may include businesses, mobile devices on the person of a user, automobiles, boats and aircraft. (col. 2, lines 40-50) “For example, automobile 22 can establish a connection to pedestrian 12 using [...] paths: (a) automobile 22 to aircraft 28 to pedestrian 12, (b) automobile 22 to building 18 to pedestrian 12, (c) automobile 22 to pedestrian 20 to automobile 16 to pedestrian 12.” (col. 3, lines 4-9) The automobile, aircraft and other nodes in the outdoor terrain are selected based on line of sight and other obstructions. “Any object or condition that interferes with a line-of-sight connection between two nodes will reduce the quality of communications between the nodes. As nodes move around within a regions of interest, the number and magnitude of obstructions between two nodes can vary significantly.” (col. 3, lines 22-29)

*Chuprun* does not disclose determining a route for a “unidirectional” channel from a source processing node to a destination processing node” as recited in claim 1. “[E]ach communications corridor 102 includes at least two nodes 90 that are capable of communicating with one another. . . .” (*Chuprun*, Col. 7, Lines 47-50) “Each node includes a wireless transceiver unit for use in establishing direct wireless links 32 (such as line-of-sight (LOS) links) with one or more other nodes in the network 10.” (*Chuprun*, Col. 2, Lines 49-50) Hence, each of the outdoor terrain nodes includes a bi-directional transceiver and is in bidirectional communication with another outdoor node.

*Chuprun* also does not disclose or suggest “a source processing node and a destination processing node” within “the array of processor nodes” as in the embodiment of claim 1. *Chuprun* nodes may include businesses, user cell phones, automobiles, boats and aircraft which exist and move around within a region of interest. Disclosure of a business, phone, and modes of transportation such as boats and planes within “terrain” does not disclose a source and destination “processing node” within an array of processor nodes. The array of processor nodes is comprised of one or more processors. None of a business, automobile, aircraft, boat, or entire cell phone are a processor, similarly, a plurality of businesses, automobiles, aircraft, boats and cell phones do not comprise an array of processors.

*Chuprun* also does not disclose or suggest that a determined route is “based on a physical description of the array of processor nodes” as in the embodiment of claim 1. *Chuprun* discloses that an automobile, ship, aircraft and other nodes in outdoor “terrain” are selected for communication based on line of sight and other obstructions. Information regarding line of sight of terrain (e.g., hills, mountains, buildings) does not anticipate or suggest a physical description of “an array of processor nodes” as recited in claim 1.

*Chuprun should not be combined with Isfeld and Hagsand*

*Chuprun* should not be combined with *Isfeld* and *Hagsand* because the references are not compatible with each other. One skilled in the art would not find it obvious to try to combine *Isfeld*, *Hagsand* and *Chuprun* because communications in *Isfeld* and *Hagsand* are not subject to signal losses due to terrain. *Isfeld* and *Hagsand* relate to broadcast over connection-less **wired** channels, where a signal is transmitted from a source **without having any information regarding any receivers that may or may not receive the signal**. Unlike *Isfeld* and *Hagsand*, *Chuprun* is related to **wireless** transceivers associated with nodes that change position outdoors and **determining information about the “region of interest” associated with the transceivers** such as location, terrain, and elevation. *Chuprun* then determines a wireless corridor based on the information about the transceivers.

For example, *Chuprun* “stores the location of each of the wireless nodes in the network.” (*Chuprun*, Col. 4, lines 23-24) “The terrain information includes at least elevation information for surface points within the region of operation.” (Id., Col. 5, Lines 1-3) *Chuprun* “determines the quality of the node-to-node links in the network 10 using the node location information and the terrain information.” (Id., Col. 5, Lines 36-38) *Chuprun* then determines a corridor based on the quality information. “Routing decisions are then made based upon the quality values.” (Id., Col 3, Lines 40-41) One of ordinary skill in the art would know that terrain and elevation effects on transceivers are not reasonably pertinent to the wired channels of *Isfeld* and *Hagsand*. Thus, it would not be obvious to try to combine the terrain/elevation mapping system of *Chuprun* with *Isfeld* and *Hagsand*. Rather, it would

be obvious to one of ordinary skill in the art that terrain mapping and transceiver elevation information stored *Chuprun* would not be of any use in the systems of *Isfeld* and *Hagsand*.

Because *Isfeld*, *Hagsand*, and *Chuprun* do not disclose or make obvious all the elements of claim 1, both in combination and considered individually, claim 1 should be allowed. Claims 2-6, 8-10, 12-13, 81-84, and 88-89 depend from claim 1 and incorporate the elements of claim 1 in addition to the patentably distinguishing limitations they recite. Therefore, claims 2-6, 8-10, 12-13, 81-84 and 88-89 are not obvious over the cited references for at least the same reasons as claim 1 and should also be allowed.

Claim 14 contains elements that distinguish the claimed embodiment from *Isfeld* and *Hagsand*, and *Chuprun* similarly to those discussed above for claim 1. Therefore, claim 14 should be allowed for at least the same reasons as claim 1. Claims 15-19, 21-23, 25-26, and 85-87 depend from claim 14 and incorporate the elements of claim 14 in addition to the patentably distinguishing limitations they recite. Therefore, claims 15-19, 21-23, 25-26, and 85-87 are not obvious over the cited reference for at least the same reasons as claim 14 and should also be allowed.

#### **Claims 4 and 17**

In addition to being dependent on allowable claim 1, claim 4 is further allowable because *Hagsand* does not teach or suggest “the unidirectional channel has a maximum number of buffers and size of buffers,” as recited in claim 4. *Hagsand* states that “[t]he delta parameter (De) may be seen as a buffer to make sure that the number of allocation changes of the bandwidth parameter (b) are minimized.” (Col. 4, lines 33-34) However, there is no teaching in *Hagsand* that the delta parameter (De) represents either a maximum number of buffers or a maximum size of buffers. Further, there is no teaching that “allocation changes” of *Hagsand* are related to either a maximum number or a maximum size of buffers. Thus, *Hagsand* does not teach “a maximum number of buffers and size of buffers,” as recited in claim 4. For at least the above reasons, claim 4 is allowable.

In addition to being dependent on allowable claim 14, claim 17 also recites “the unidirectional channel has a maximum number and size of buffers,” and should be allowable for at least the same reasons as claim 4.

#### Claims 5 and 18

In addition to being dependent on allowable claim 1, claim 5 is further allowable because *Hagsand* does not teach “reserving intermediate resources for the unidirectional channel based on the bandwidth requirements,” as recited in claim 5. In the Examiner’s “Response to Arguments” on p. 12 of the *Office Action*, the Examiner asserts:

As the cited portion of *Hagsand* discloses “... if the traffic flow is increased, more bandwidth may be allocated to the channel 100 and if the traffic flow is decreased, the allocated bandwidth may be reduced ...” which the examiner interprets as reserving intermediate resources for the unidirectional channel.”

The Applicants respectfully submit that the Examiner’s interpretation is not supported by the cited reference. The cited reference discloses that the bandwidth allocation is based on traffic flow. The Examiner appears to interpret bandwidth allocation to be an “intermediate resource” for a “unidirectional channel” and traffic flow to be a “bandwidth requirement.” Thus, the Examiner appears to be interpreting *Hagsand* to disclose that bandwidth allocation is based on bandwidth requirements. However, there is no disclosure cited by the Examiner in *Hagsand* to support these apparent interpretations. For example, the cited reference is silent regarding unidirectional channels and reservation of intermediate resources for unidirectional channels. In addition to being dependent on allowable claim 14, claim 18 recites “configured to reserve intermediate resources for the unidirectional channel,” and should be allowable for at least the same reasons as claim 5.

Further, claim 18 recites the additional limitation that “the source processing node and the destination processing node are configured to reserve intermediate resources.” There is no disclosure in *Hagsand* that **both** the source processing node **and** the destination processing node “are configured to reserve intermediate resources,” as recited in claim 18. For at least the above reasons, claim 18 is allowable.

## Claims 6 and 19

In addition to being dependent on allowable claim 1, claim 6 is further allowable because *Hagsand* does not teach “guaranteeing bandwidth based on the bandwidth requirements using time division multiplexing,” as recited in claim 6.

In the previously submitted response (filed June 3, 2009) the Applicants presented evidence quoting *Hagsand*’s statement that “it is **almost guaranteed** that the data will reach the receivers at the rate given by the capacity of the channel increasing bandwidth allocation.” (*Hagsand*, Col. 2, Lines 37-38) (Emphasis added). “Almost guaranteed” is facially not the same as “guaranteeing bandwidth.” In the response to the evidence submitted by the Applicants, the Examiner asserted that:

“almost guaranteed” and applicant’s “guaranteeing bandwidth” is equivalent. The examiner states to applicant’s that there is no 100% guarantee in bandwidth allocations as there may be errors, failures and other technical issues which may arise and as such, bandwidth allocation is “almost guaranteed” at best. (Office Action, p. 13, Section 29)

The Applicants respectfully disagree with the Examiner’s opinion and request the Examiner to provide supporting evidence that “almost guaranteed” of the cited reference is **equivalent** to “guaranteeing bandwidth” as recited in claim 6.

The Applicants respectfully submit that the Examiner’s speculation on what may occur in the event of “errors, failures and other technical issues” forms no part of the claimed subject matter or the cited reference. Facially, “almost guaranteed” contemplates that occasionally data **will not** reach the receivers at the rate given by the capacity of the channel, necessitating an increase in bandwidth allocation. Facially, “guaranteeing bandwidth” contemplates that the destination processing will receive the data over the channel. Thus, on its face, “guaranteeing bandwidth” is materially different from “almost guaranteed,” which is not guaranteed. For at least the above reasons, claim 6 is allowable.

In addition to being dependent on allowable claim 14, claim 19 also recites “the source processing node is configured to guarantee bandwidth based on the bandwidth

requirements using time division multiplexing,” and should be allowable for at least the same reasons as claim 6.

#### Claims 8 and 21

In addition to being dependent on allowable claim 1, claim 8 is further allowable because *Isfeld* does not teach “polling a plurality of channels to check if data is received into the receive buffer for the **unidirectional** channel,” as recited in claim 8. As discussed above, The Examiner correctly states that the combination of *Isfeld* and *Hagsand* does not disclose a uni-directional channel. As further discussed above, *Chuprun* also does not teach or suggest a unidirectional channel. For at least the above reasons, claim 8 is allowable.

In addition to being dependent on allowable claim 14, claim 21 also recites “the destination processing element is configured to poll a plurality of channels to check if data is received into the receive buffer for the **unidirectional** channel,” and should be allowable for at least the same reasons as claim 8. For at least the above reasons, claim 21 is allowable.

#### Claims 9 and 22

The Applicants respectfully request the Examiner to answer the substance of the Applicants’ arguments submitted on June 3, 2009 in response to the *Final Office Action* of March 4, 2009. In rejecting claims 9 and 22 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants’ arguments. The Manual of Patent Examining Procedure (MPEP) §707.07(f) states in pertinent part that “[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant’s argument and answer the substance of it.” The Applicants therefore respectfully insist that the Examiner either allow claims 9 and 22 or answer the substance of the Applicants’ arguments set forth in the response to the *Final Office Action*, as required by the MPEP §707.07(f) and 2106.

In addition to being dependent on allowable claim 1, claim 9 is further allowable because *Isfeld* does not teach “freeing the transmit buffer using the source processing

element,” as recited in claim 9. In repeating the rejection, the Examiner did not identify the limitation “using the source processing element” in any of the cited references. The Applicants respectfully remind the Examiner that “All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). The Applicants respectfully request the Examiner to consider the limitation “using the source processing element” and provide grounds for rejecting this limitation or allow claim 9. The Applicants respectfully remind the Examiner that as claim 9 is not first introduced or amended in this response, a rejection of this claims on new grounds cannot now be made in a final office action.

As argued in response to the *Final Office Action*, *Isfeld* discloses that “the IOS driver frees up the transmit buffers.” (*Isfeld*, Col. 34, Line53) The IOS is a semi intelligent I/O module. For example, *Isfeld* states that “FIG. 3 provides a block diagram of a semi-intelligent I/O module (IOS) such as used in the system of FIG. 1.” (*Isfeld*, Col. 5, Lines 3-4). Thus, the IOS is not a “source processing element” as recited claim 9. For at least the above reasons, claim 9 is allowable.

In addition to being dependent on allowable claim 14, claim 22 also recites “the source processing element is configured to free the transmit buffer,” and should be allowable for at least the same reasons as claim 9.

#### **Claims 10 and 23**

In rejecting claims 10 and 23 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants’ arguments regarding these claims. The Applicants respectfully request the Examiner to answer the substance of the Applicants’ arguments regarding claims 10 and 23 that were submitted in response to the *Final Office Action* of March 4, 2009 or allow these claims.

Further, in repeating the rejection, the Examiner did not consider the claim 10 limitation of “using the destination processing element,” as required. The Applicants respectfully request the Examiner to consider the limitation “using the destination



processing element” and provide grounds for rejecting this limitation or allow claim 10. The Applicants respectfully remind the Examiner that as claim 10 is not first introduced or amended in this response a rejection of this claim on new grounds cannot now be made in a final office action.

As argued in response to the *Final Office Action* of March 4, 2009, *Isfeld* discloses “maintaining a list of free receive buffers.” (*Isfeld*, Col. 38, claim 11, Line 36) However, there is no disclosure in claim 11 of *Isfeld* or in any of its dependent claims that the list is maintained by a “destination processing element,” as recited in claim 10 of the present Application. Moreover, there is no disclosure in any of the dependent claims in *Isfeld* of freeing a buffer using the destination processing element. For at least the above reasons, claim 10 of the present Application is allowable.

In addition to being dependent on allowable claim 14, claim 23 also recites that “the destination processing element is configured to free the receive buffer,” and should be allowable for at least the same reasons as claim 10.

#### **Claims 12 and 25**

In rejecting claims 12 and 25 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants’ arguments regarding these claims. The Applicants respectfully request the Examiner to answer the substance of the Applicants’ arguments regarding claims 12 and 25 that were submitted in response to the *Final Office Action* of March 4, 2009 or allow these claims.

Further, in repeating the rejection, the Examiner did not consider the claim 12 limitation that “reading the data from the receive buffer **into the destination processing element** is based on the pointer.” The Applicants respectfully request the Examiner to consider the limitation “into the destination processing element” and provide grounds for rejecting this limitation or allow claim 12. The Applicants respectfully remind the Examiner that as claim 12 is not first introduced or amended in this response a rejection of this claim on new grounds cannot now be made in a final office action.

In addition to being dependent on allowable claim 14, claim 25 also recites “the destination processing element is configured to . . . receive the data from the receive buffer based on the pointer,” similar to claim 12 and should be allowable for at least the same reasons as claim 12.

#### **Claims 13 and 26**

In rejecting claims 13 and 26 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants’ arguments regarding these claims. The Applicants respectfully request the Examiner to answer the substance of the Applicants’ arguments regarding claims 13 and 26 that were submitted in response to the *Final Office Action* of March 4, 2009 or allow these claims.

#### **Claim 86**

In addition to being dependent on allowable claim 1, claim 86 is further allowable because *Chuprun* does not teach or suggest “a compiler,” as recited in claim 86. The Examiner correctly states regarding claim 86 that “neither *Isfeld* nor *Hagsand* discloses wherein a compiler is configured to determine routing information for one or more channels and assign a task to one or more destination processing nodes.” (*Office Action*, p. 10 Section 20) However, *Chuprun* does not disclose a compiler. The cited portions of *Chuprun* discuss basing routing decisions on the motion of nodes in and around terrain.

As nodes move around within a region of interest, the number and magnitude of the obstructions between two nodes can vary significantly. Therefore, in accordance with the present invention, a system is provided that bases routing decisions in a network on knowledge of the terrain within which the network is operating.” (*Chuprun*, Col. 3, lines 27-33)

However, there is no disclosure of a compiler in *Chuprun* that determines the routing. Moreover, since the routing is based on the motion of nodes within terrain, determining routing information at compile time would not work. That is, routing information

determined at compile time would immediately become invalid as mobile nodes move to new locations. For at least the above reasons, claim 86 is allowable.

#### **Claim 88**

In addition to being dependent on allowable claim 1, claim 88 is further allowable because *Chuprun* does not teach or suggest “a unidirectional channel” or “an application description,” as recited in claim 88. The Examiner correctly states that “neither *Isfeld* nor *Hagsand* discloses wherein determining a route for a unidirectional channel is based on an application description.” (*Office Action*, p. 10 Section 22) However, as discussed above, *Chuprun* does not disclose a unidirectional channel. Moreover, *Chuprun* does not disclose an application or an application description. For example, *Chuprun* does not disclose an application description that indicates tasks for applications or an application description that indicates channels for communications between the tasks. The cited portions of *Chuprun* disclose a selecting “a path based on a desired goal for the connection.” (*Chuprun*, Col. 6, lines 13-14) However, a goal is not the same as an application or an application description. For at least the above reasons, claim 88 is allowable.

#### **Claim 89**

In addition to being dependent on allowable claim 1, claim 89 is further allowable because *Chuprun* does not teach or suggest allocation of “communication bandwidth between a first task on the source processing node and a second task on the destination processing node,” as recited in claim 89. The Examiner correctly states that “neither *Isfeld* nor *Hagsand* discloses wherein generating the unidirectional channel along the determined route is based on an allocated communication bandwidth between a first task on the source processing node and a second task on the destination processing node.” (*Office Action*, p. 11 Section 23) However, *Chuprun* does not disclose allocation of bandwidth. The cited portions of *Chuprun* disclose selecting “a path based on a desired goal for the connection.” (*Chuprun*, Col. 6, lines 13-14) However, selecting a path is not the same as allocating bandwidth. Moreover, the bandwidth (quality) is subject to the positions of mobile nodes as

they move about within terrain. Thus, bandwidth cannot be allocated under such dynamic conditions. For at least the above reasons, claim 89 is allowable.

Rejection under 35 U.S.C. §103 in view of *Isfeld* and *Plante*

The Examiner rejected claims 7 and 20 under 35 U.S.C. §103(a) as being unpatentable over *Isfeld* in view of United States Patent Publication No. 2004/0208602 (*Plante*).

In rejecting claims 7 and 20 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants' arguments regarding these claims. The Applicants respectfully request the Examiner to answer the substance of the Applicants' arguments regarding claims 7 and 20 that were submitted in response to the *Final Office Action* of March 4, 2009 or allow these claims.

Rejection under 35 U.S.C. §103 in view of *Isfeld* and *Pitts*

The Examiner rejected claims 11 and 24 under 35 U.S.C. §103(a) as being unpatentable over *Isfeld* in view of United States Patent No. 6,505,241 (*Pitts*).

In rejecting claims 11 and 24 in the present *Office Action*, the Examiner has repeated the rejection set forth in the *Final Office Action* mailed on March 4, 2009. However, the Examiner has not answered the substance of the Applicants' arguments regarding these claims. The Applicants respectfully request the Examiner to answer the substance of the Applicants' arguments regarding claims 11 and 24 that were submitted in response to the *Final Office Action* of March 4, 2009 or allow these claims.

### Conclusion

Based on the foregoing remarks, the Applicants believe the rejections of the claims have been overcome, and that the pending claims in the present Application are in condition for allowance. If the Examiner has any questions regarding the Application, the Examiner is invited to contact the Applicants' undersigned representative.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-0600 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Ricardo Gonzalez et al.

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By:                     /ron rohde/                    

Reg. No. 45,050  
Carr & Ferrell LLP  
2200 Geng Road  
Palo Alto, CA 94303  
Phone: (650) 812-3400  
Fax: (650) 812-3444